

REMARKS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 1-9, 11, 12, and 14-18 are pending in the present application. Claims 1, 9, 16, and 17 are amended, and Claims 10 and 13 are cancelled without prejudice or disclaimer by the present amendment.

In the outstanding Office Action, Claims 1, 4, 6, 7, 9, and 12 were rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 5,680,190 to Michibayashi et al. (hereinafter "Michibayashi"); Claims 2, 3, and 18 were rejected under 35 U.S.C. § 103(a) as unpatentable over Michibayashi in view of U.S. Patent No. 6,198,516 to Kim et al. (hereinafter "Kim"); Claim 5 was rejected under 35 U.S.C. § 103(a) as unpatentable over Michibayashi in view of U.S. Patent No. 6,335,771 to Hiraishi and in further view of U.S. Patent No. 6,320,204 to Hirabayashi et al. (hereinafter "Hirabayashi"); Claim 8 was rejected under 35 U.S.C. § 103(a) as unpatentable over Michibayashi in view of U.S. Publication No. 2001/0019392 A1 to Sakamoto et al. (hereinafter "Sakamoto"); Claim 11 was rejected under 35 U.S.C. § 103(a) as unpatentable over Michibayashi in view of U.S. Patent No. 6,104,461 to Zhang et al. (hereinafter "Zhang"); Claim 13 was rejected under 35 U.S.C. § 103(a) as unpatentable over Michibayashi in view of U.S. Publication No. 2002/0109652 A1 to Lim et al. (hereinafter "Lim"); Claim 14 was rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 5,541,753 to Raynes et al. (hereinafter "Raynes") in view of Michibayashi; Claim 15 was rejected under 35 U.S.C. § 103(a) as unpatentable over Raynes in view of Michibayashi and in further view of U.S. Patent No. 6,423,385 to Kagawa et al. (hereinafter "Kagawa"); and Claims 16 and 17 were rejected under 35 U.S.C. § 103(a) as unpatentable over Michibayashi.

Claims 1, 9, 16, and 17 are amended to incorporate the subject matter of canceled Claim 13, which stands rejected only under 35 U.S.C. § 103(a) as unpatentable over Michibayashi in view of Lim. Thus, that rejection is now addressed with respect to Claims 1, 9, 16, and 17.

As previously presented, Claim 1 is directed to a liquid crystal display device including, in part, first and second pixel electrodes that apply first and second electric fields of varied strength to the liquid crystal of a pixel. As amended, Claim 1 now further clarifies that a ratio of first and second voltages applied to the first and second pixel electrodes is maintained from 0.5:1.0 to 0.9:1.0. Claims 1, 9, 16, and 17 recite the same ratio.

By way of background, Applicants note that different voltages are conventionally applied to first and second pixel electrodes within a pixel to create regions having different electric field strength, which in turn expands the viewing angle range of the pixels (Applicants' specification, page 9, lines 16-18).

In a non-limiting example, benefits of maintaining the specific claimed ratio are explained in Applicants' specification with reference to Figure 13(a). As shown, viewing angle improvement, *i.e.*, improved angle relative to gray scale inversion, is correlated to the thickness of an insulating film arranged between the first and second pixel electrodes (Applicants' specification, page 30, lines 7-20). As further explained, viewing angle improvement is similarly correlated to the ratio of the voltage applied to the liquid crystal layer between the transparent electrode 24 and the first pixel electrode, and the voltage applied to the liquid crystal layer between the transparent electrode 24 and the second pixel electrode (Applicants' specification, page 30, line 20 – page 31, line 3). With respect to viewing angle improvement, it is preferable that a minimum voltage ratio of 0.9:1.0 be maintained (Applicants' specification, page 30, lines 3-5). With respect to driving voltage,

power consumption, and driving circuit costs, it is preferable that a maximum voltage ratio of 0.5:1.0 be maintained (Applicants' specification, page 30, lines 5-8).

The outstanding Office Action cites Lim as teaching the claimed voltage ratio range. However, as stated by the Office Action, Lim teaches first and second pixel electrodes "that become equal to each other" (Office Action, 10/7/2003, page 6, last para.). Thus, the combination of Michibayashi and Lim does not teach the limitation of a ratio from 0.5:1.0 to 0.9:1.0 for the voltages applied to first and second pixel electrodes. Moreover, the combination does teach the more general limitation of applying different first and second electric field strengths to the first and second pixel electrodes.

Further, Applicants respectfully submit there is no motivation to combine the teachings in Michibayashi and Lim. The Office Action cites paragraphs 42 and 43 of Lim as providing such motivation. However, paragraph 42 only discusses the arrangement of the second pixel electrode 32 with respect to dummy components, and concludes, "[T]he dummy pixel electrodes 18 enable the second pixel electrode 32 to have the same coupling effect as the first pixel electrode 22" (Lim, col. 3, para. 42). Paragraph 43 only discusses the voltages applied to first and second pixel electrodes, and concludes "voltages charged in the first and second pixel electrodes 22 and 32 become equal to each other" (Lim, col. 3, para. 43). Michibayashi teaches maintaining *different* voltages applied to first and second pixel electrodes to improve viewing angle (Michibayashi, col. 6, lines 25-40). Lim teaches a configuration for maintaining first and second pixel electrodes at equal voltages. Thus, the proposed modification renders the device of Michibayashi unsatisfactory for its intended purpose (MPEP § 2143.01).

Accordingly, for the reasons stated above, Applicants respectfully submit independent Claims 1, 9, 16, and 17, and Claims 2-6, 8, 11, 12, and 18 depending therefrom, are allowable.

Claim 14 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Raynes in view of Michibayashi. That rejection is respectfully traversed.

As previously presented, Claim 14 is directed a liquid crystal display device including, in part:

an optical compensating film disposed between said polarizing plate and said substrate having stabilized the orientation state of discotic liquid crystal.

The outstanding Office Action cites the fixed retarders 30, 31 of Raynes (Figure 6) as teaching the optical compensating film (Office Action, 10/04/2003, page 7, para. 2).

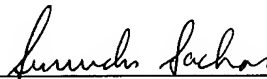
However, as their name implies, the fixed retarders 30, 31 apply a fixed retardance of $\lambda/8$, $\lambda/4$, and $\lambda/2$ to the liquid crystal layer (Raynes, col. 7, lines 3-12). The claimed optical compensating films are not fixed retarders. Rather, the optical compensating films 302a, 302b, as shown as a non-limiting example in Figure 14, provide director angle changes continuously in the depthwise direction (Applicants' specification, page 33, lines 16-21). Thus, the absolute value of retardation lies within a continuous range of 5° to 50° from the normal (Applicants' specification, page 33, line 19 – page 34, line 3).

Accordingly, Applicants respectfully request the rejection of independent Claim 14 and Claim 15 depending therefrom, as unpatentable over Raynes in view of Michibayashi, be withdrawn.

Consequently, in light of the above discussion and in view of the present amendment, the present application is believed to be in condition for allowance, and an early and favorable action to that effect is respectfully requested.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



Gregory J. Maier
Attorney of Record
Registration No. 25,599

Customer Number
22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 08/03)

Surinder Sachar
Registration No. 34,423

GJM/SNS/STD/mac
I:\ATTY\STD\21'S\218433US\218433US.AM2.DOC